Transition policy and monitoring in the Netherlands

TNO Environment, Energy and Process Innovation

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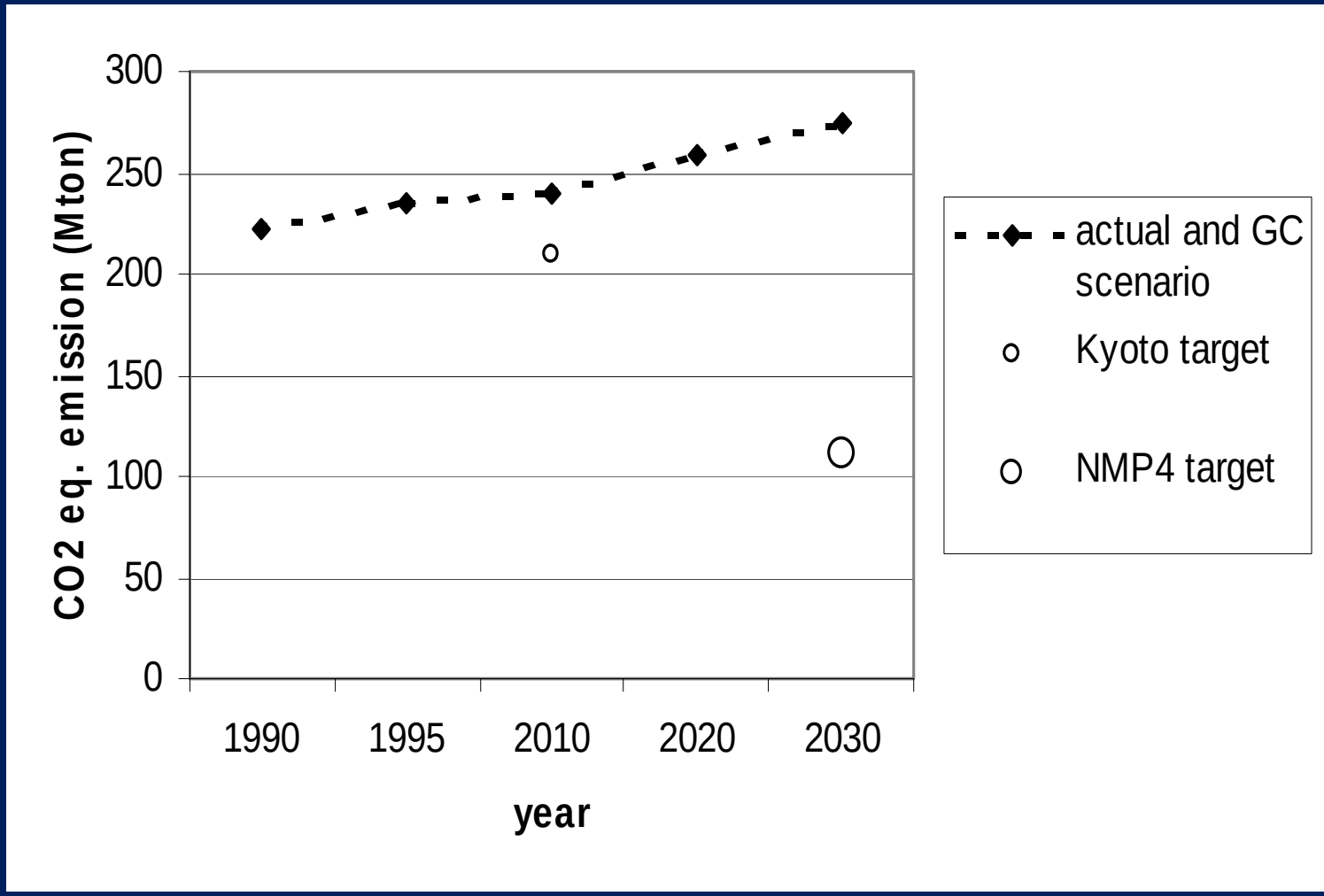
Content of presentation

- Introduction on transition policy
- Transition monitoring and indicators
- An example: CO_2 emission
- Concluding remarks


300
250
200
150
100
50
0
CO2 eq. emission (Mton)
1990
1995
2010
2020
2030
year
actual and GC scenario
Kyoto target
NMP4 target

What is a transition ?

- Process of fundamental change of a complex part of the society
- Pointing to a socially desired sustainable future

Desired future as depicted in the National Environmental Policy Plan (NEPP-4, 2001)

- Preservation of bio-diversity
- Preservation of natural resources
- Preservation of health and security
- High quality of living environment

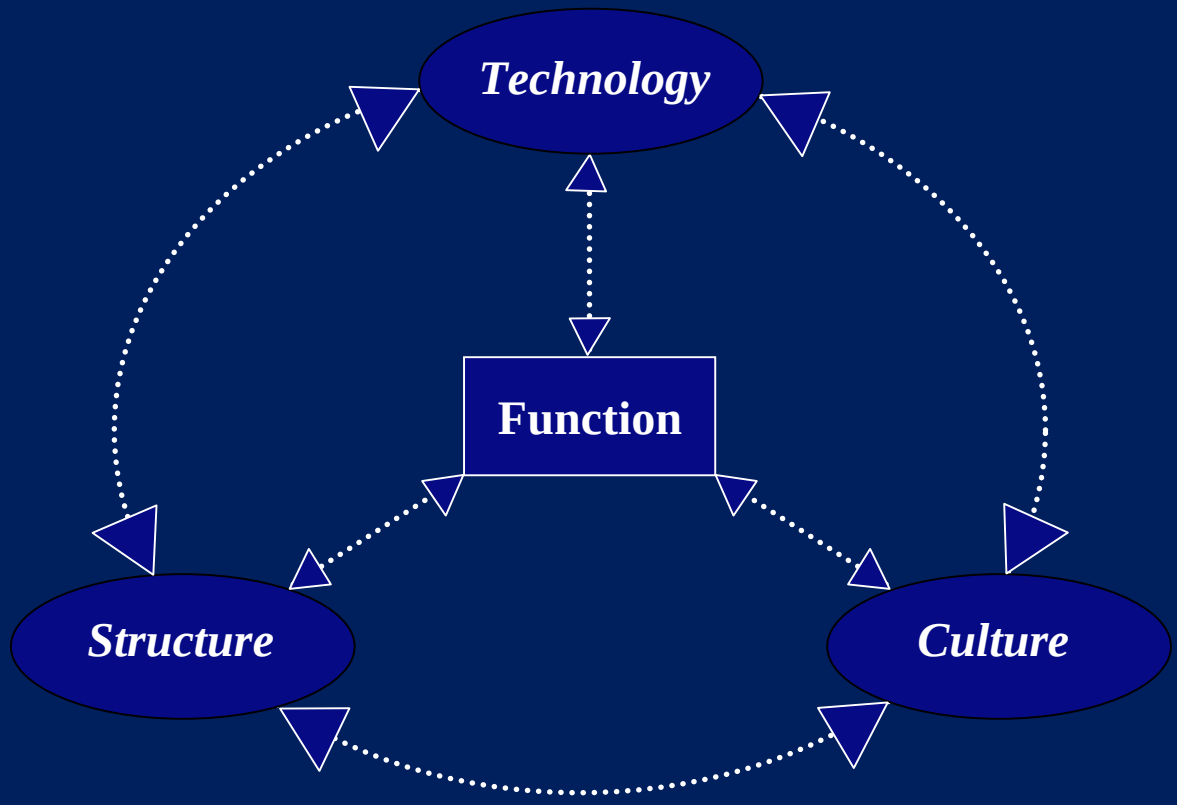
Transitions elaborated in NEPP-4

- Emission-low energy economy
- Sustainable production and consumption
- High quality of living environment
- Sustainable agriculture and nature
- Consideration of risks related to genetic modification, persistent organic pollutants, non-assessed chemicals, etc.

Aims of the Dutch government

- To resolve persistent environmental problems
- To achieve transitions by concerted actions in the field of technology, structure and culture

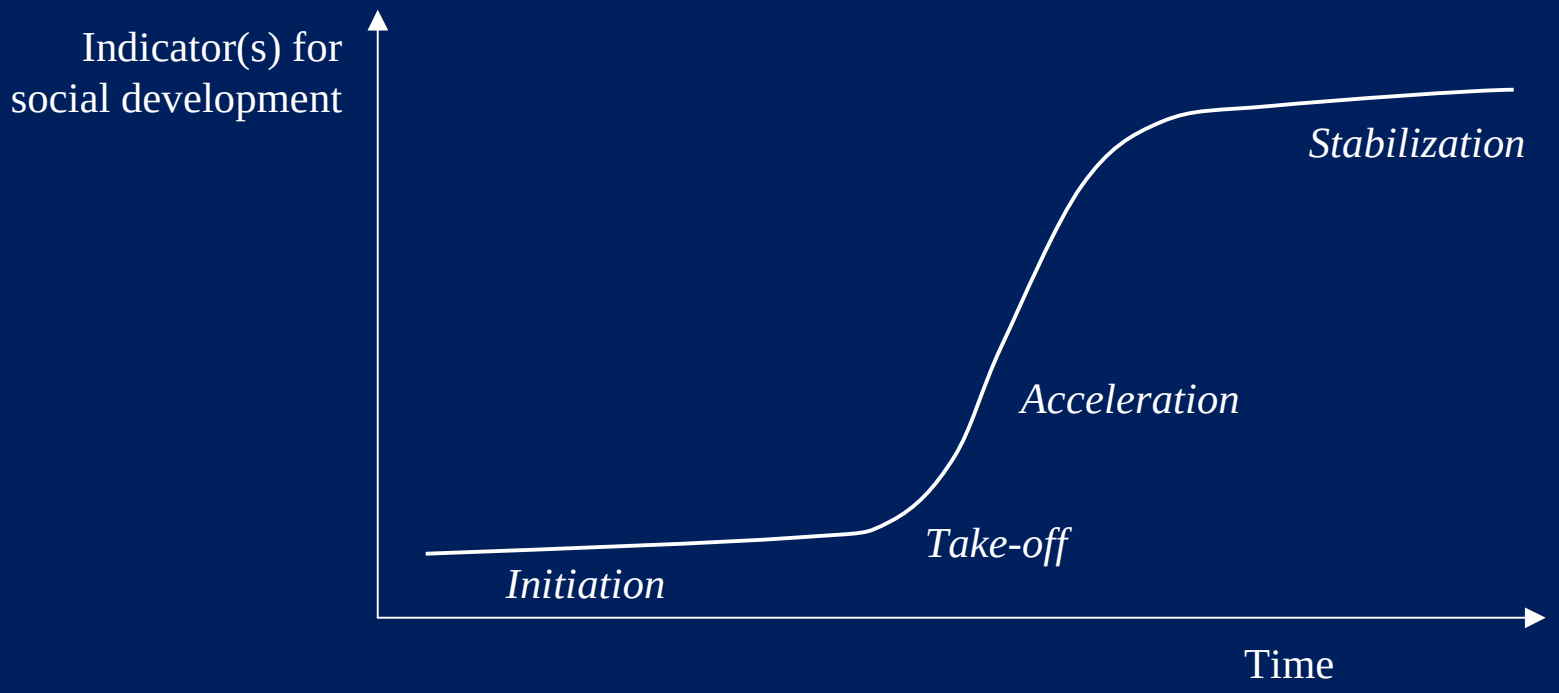
The way human needs and functions are fulfilled is essential in transitions



Surplus value of transition policy above traditional environmental policy

- Long-term considerations and goals as a basis for short-term policy
- Multi-domain (technology, structure and culture) and multi-actor (government, industry, research organizations) orientation
- Anticipation on robust trends and steering on system innovations and improvements

Different phases of a transition



Initiation and take-off phase

- Acceptation of problem by business community and citizens
- Mobilization of all those concerned in society
- Formulation and build-up of coalitions
- Selection of a challenging transition goal
- Formulation of in-between goals (MOU)
- Backcasting: exploration of activities necessary to achieve (in-between) goals
- Evaluation of opportunities and threats

TES = PS x APP x ESUP (Commoner, 1972)

- TES = total environmental strain
- PS = population size
- APP = average prosperity per person
- ESUP = environmental strain per unit of prosperity

Average prosperity per person (APP)

- Property per person *x* Material through-flow per property

Environmental strain per unit of prosperity (ESUP)

- Environmental strain per material through-flow

An example: CO_2 emissions from road traffic

- 100 people traveling 10 km using a normal gasoline engine, consuming 1 liter of gasoline for each 10 km
- PS = 100
- APP = 1 car per person *x* 1 liter of gasoline per car
- ESUP = a kg CO_2 per liter of gasoline
- TES = PS x APP x ESUP =100 a kg CO_2

Possibilities for CO_2 emission reduction from road traffic (1)

- Car-sharing or using other transport means (e.g. bus, bike)
  - Change of conventions and values difficult due to robust trend towards individualization
  - Car-sharing should be promoted to overcome disadvantage of less freedom
  - Initiatives are present in the Netherlands, breakthrough has not been achieved

Possibilities for CO_2 emission reduction from road traffic (2)

- Using cars consuming less gasoline
  - more efficient engines have been developed but improvements are still possible
  - environmental gain is smaller than increase in mobility

Possibilities for CO_2 emission reduction from road traffic (3)

- Development of CO_2 neutral fuel (bio-fuel, hydrogen) and fuel cells
- Currently coalitions are formed realizing innovations necessary (start of transition process!)
- Government may help by specific R&D programs and legislation (e.g. by prescribing zero-emission vehicles)

Policy to reduce environmental strain (1)

- Reducing the material through-flow per property
  - choice and design of materials
  - improving efficiency
  - waste collection and recycling

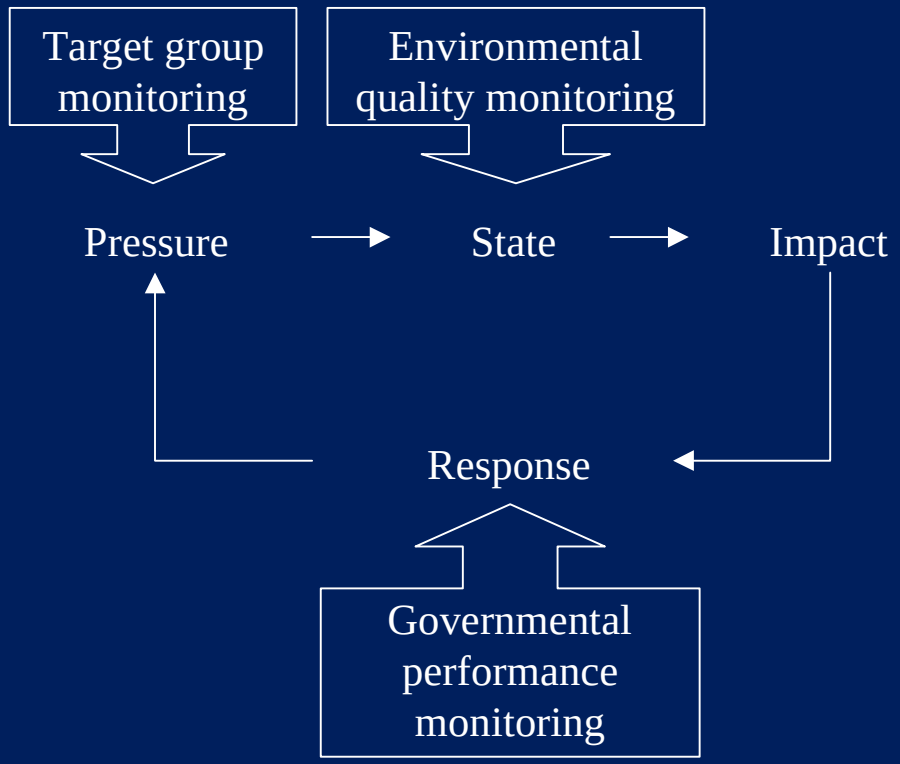
Policy to reduce environmental strain (2)

- Reducing the environmental strain per material through-flow
  - add-on technology
    (e.g. CO_2 storage)
  - process-integrated technology
    (e.g. using emitted CO_2 by chemical industry in greenhouses)
  - sustainable technology
    (e.g. using CO_2 emission-low fuels)

Policy to reduce environmental strain (3)

- Reducing the property per person
  - Influencing the culture of society (conventions and values)
  - Essential questions are: What do we need? What is enough ?
  - Human behaviour can e.g. be influenced by accomodating all environmental costs in the price of needs and functions (e.g. by means of eco-tax)

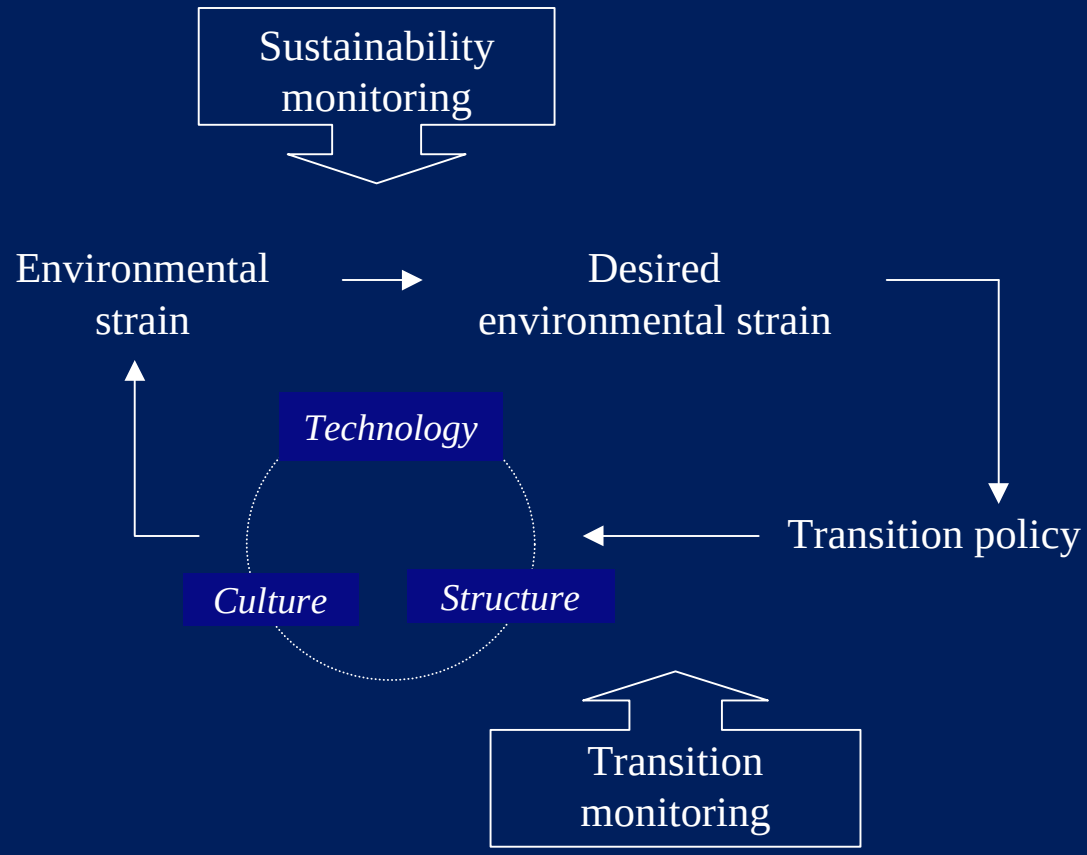
Current environmental monitoring in the Netherlands



Characteristics of current environmental monitoring systems

- Information on material through-flow per property and environmental strain per material through-flow generally is available
- Information on the property per person is only partly available
- Information on transition processes is not available

Sustainability and transition monitoring: point of application on cause–effect chain



Indicators for sustainability monitoring

- The use of key-resources (energy, natural resources, biodiversity, space, clean air, water and soil, safety, etc) per unit of production and consumption
- The property per person and dynamics in meeting human needs and functions, including driving forces

Indicators for transition (process) monitoring

- Acceptance of problem by business community and citizens
- Mobilization of all those concerned in society
- Formulation and build-up of coalitions
- Selection of a challenging transition goal
- Formulation of in-between goals (MOU)
- Exploration of activities necessary to achieve (in-between) goals
- R&D, local initiatives, example projects